

# INSTALLATION INSTRUCTIONS FOR THE SPEED SENSORS, SNG-S SERIES

**32347440**

Issue A

## GENERAL SPECIFICATIONS

Honeywell's SNG-S Series Speed Sensors use a magnetically biased Hall-effect integrated circuit (IC) to accurately sense movement of ferrous metal targets. The specially designed IC and a permanent magnet are sealed in rugged, probe-type packages. The IC detects the alteration of the magnet's flux density when it is approached by ferrous metal. A sensor

positioned at the circumference of a revolving gear wheel detects the teeth and spaces, and supplies a digital pulse output with frequency proportional to gear wheel speed. Optimum performance is dependent upon a combination of variables such as target material, geometry and speed, sensor/target gap, and environmental temperature.

**TABLE 1. ELECTRICAL SPECIFICATIONS**

| CHARACTERISTIC             | CONDITION/COMMENT                                      | PARAMETER                |  |                              |                              |
|----------------------------|--|--------------------------|--|------------------------------|------------------------------|
|                            |  | SNG-SPRF-002             | SNG-SPRD-002<br>SNG-SPSC-001<br>SNG-SPRC-001 | SNG-SPRD-003<br>SNG-SPRC-002 | SNG-SPRD-004<br>SNG-SPRC-003 |
| Supply voltage             | regulated supply and 12 V battery<br>ISO 16750-2       | 4.5 V to 24 V<br>–       | –<br>8 V to 16 V                             | –<br>4.8 V to 16 V           | –<br>4.8 V to 24 V           |
| Supply current             | –  | 20 mA max.               |  | 15 mA                        |                              |
| Reverse voltage protection | –<br>ISO 16750-2                                       | -24 V<br>–               |  | –<br>-14 Vdc                 |                              |
| Over voltage protection    | –<br>ISO 16750-2                                       | 26.5 V<br>–              |  | –<br>26 V                    |                              |
| Short circuit protection   | –<br>ISO 16750-2                                       | 16 V<br>–                |  | –<br>16 V                    |                              |
| Load dump                  | ISO 16750-2:2012 11 01<br>(US* = 40 V, UA 13.5 ±0.5 V) | 5b<br>–                  |  | –<br>–                       |                              |
| Insulation resistance      | ISO 16750-2:2012                                       | >10 MOhm at 500 Vdc<br>– |  | –<br>–                       |                              |

**TABLE 2. MECHANICAL SPECIFICATIONS**

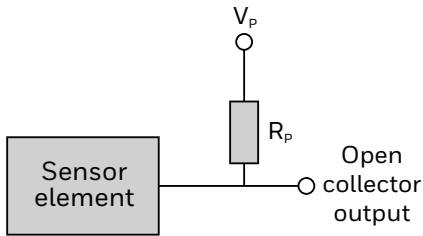
| CHARACTERISTIC                | PARAMETER   |  |  |                              |
|-------------------------------|---|--|--|------------------------------|
|                               | SNG-SPRF-002  | SNG-SPRD-002<br>SNG-SPSC-001<br>SNG-SPRC-001 | SNG-SPRD-003<br>SNG-SPRC-002               | SNG-SPRD-004<br>SNG-SPRC-003 |
| Carrier material              | PBT thermoplastic   |  | PBT  |                              |
| Bushing material              | SS304   |  | SSTL                                       |                              |
| O-ring material               | 70 durometer fluorocarbon, PTFE coating,<br>17,17 mm ID x 1,78 CS |  | fluorocarbon, brown, 17,17 mm ID x 1,78 CS |                              |
| Housing material              | PBT   |  | PBT  |                              |
| Connector:<br>integral mating | Bosch 928000453<br>Bosch 1928403966                               |  | Amp Superseal 1.5<br>282087                |                              |
| Mounting torque               | 8 ±0,5 N m with M6 screw  |  | 20 ±3 N m with M8 screw                    |                              |
| O-ring lubrication            |   | mineral oil-based grease                     |  |                              |

**TABLE 3. ENVIRONMENTAL SPECIFICATIONS**

| CHARACTERISTIC                          | CONDITION/COMMENT  | PARAMETER   |  |
|---|--|---|--|
|   |  | SNG-SPRF-002  | ALL OTHER CATALOG LISTINGS                   |
| Radiated immunity                       | ISO 11452-2: 2004<br>ISO 11452-2: 2004<br>IEC 61000-4-3: 2008<br>ISO 11452-2, 400 MHz to 2.5 GHz                       | 10 kHz to MHz, 60 m/V<br>200 MHz to 2.7 GHz, 100 V/m<br>800 kHz MHz to 1000 MHz, 3 m/V<br>– | –<br>–<br>–<br>100 V/m                       |
| Bulk current injection                  | ISO 11452-4, 1 MHz to 400 MHz  | 100 mA  |  |
| ESD                                     | SAE J1113/13<br>ISO 10605  | ±4 kV contact, ±8 kV air<br>–   | –<br>±8 kV contact, ±15 kV air               |
| Conductive transients                   | ISO 7637-2, for 12 V system<br>ISO 7637-2, for 12 V system   | TEST PULSE 1, 2a, 2b, 3a, 3b<br>–   | –<br>PULSE 1, 2a, 3a, 3b, 5a                 |
| Conducted emissions                     | CISPR 25. 150 kHz to 108 MHz   | –   | Class 3                                      |
| Radiated emissions                      | CISPR 25. 150 kHz to 12.5 GHz  | –   | Class 3                                      |
| Thermal cycle                           | -40°C to 140°C   | –   | 100 cycles                                   |
| Humidity                                | –  | 10 %RH to 90 %RH at -40°C to 85°C,<br>150 cycles, 600 hr total                              | –  |
|   | 95 %RH at 55°C   | –   | 144 hr, EN/IEC 60068-2-30                    |
| Saline dunk                             | 0°C to 110°C   | –   | 10 cycles, ISO 16750-4                       |
| Salt fog                                | 5% salt solution by mass at 35°C and 93% RH for 400 hr, tested to 2000 hr with no ingress in the sensor packaging area | 5% salt solution by mass at 35°C and 93% RH for 2000 hr                                     | –  |
|   | 5% salt solution by mass at 35°C   | –   | 96 hours                                     |
| Combined temperature and vibration test | sinusoidal: 25 hr/axis, 3 perpendicular axes 30 g at 60 Hz to 1000 Hz and 15 g at 1000 Hz to 2000 Hz                   | sinusoidal: 25 hr/axis, 3 perpendicular axes 15 g at 5 Hz to 2000 Hz                        | –  |
|   | random: 25 hr/axis, 3 perpendicular axes 30 g at 25 rms Hz to 2000 Hz, -40°C to 125°C                                  | random: 25 hr/axis, 3 perpendicular axes at 25 grms at 10 Hz to 2000 Hz                     | –  |
| Vibration                               | 3 perpendicular axes, 48 hr per axis   | –   | 29.8 GRMS, 24 Hz to 2000 Hz, MIL-STD-202-214 |
| Degree of protection                    | IEC 50629<br>IEC 60529   | IPX6, IPX9K, IPX7<br>–  | –<br>IP69K, IP67                             |
| Resistance to fluids                    | –  | –   | general under-the-hood automotive fluids     |
| Operating temperature                   | –  | -40°C to 150°C  | -40°C to 140°C                               |
| Storage temperature                     | –  | -55°C to 70°C   | -40°C to 140°C                               |

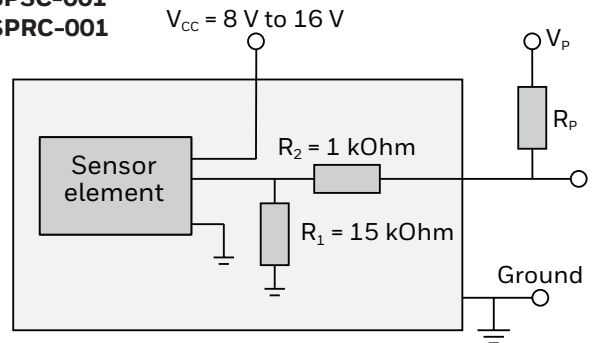
**FIGURE 2. SCHEMATIC DIAGRAMS AND OUTPUT SPECIFICATIONS**

**SNG-SPRF-002**



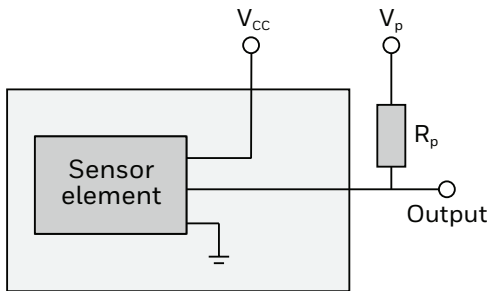
| CHARACTERISTIC         | CONDITION/COMMENT                         | PARAMETER                                |
|------------------------|---|--|
| Signal type            | open collector                            | square wave                              |
| Power on               | –   | default high and start from initial edge |
| Signal polarity        | not dependent on target rotation          | output low on teeth                      |
| Output signal:<br>high | –   | $\geq V_p - 0.5\text{ V}$                |
| low                    | –   | $\leq 0.6\text{ V}$                      |
| Load current           | output leakage current $-10\ \mu\text{A}$ | 10 mA max.                               |
| Frequency              | –   | 0 kHz to 10 kHz                          |

**SNG-SPRD-002**  
**SNG-SPSC-001**  
**SNG-SPRC-001**



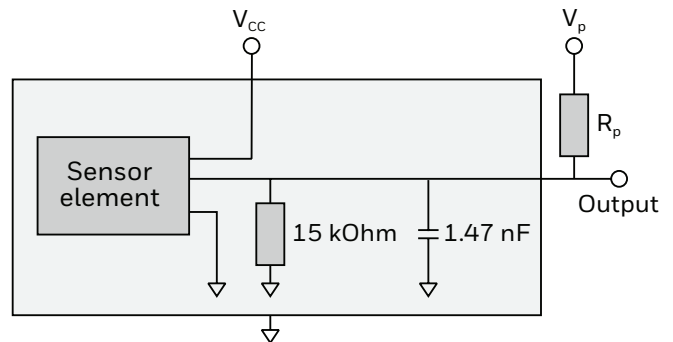
| CHARACTERISTIC         | CONDITION/COMMENT   | PARAMETER   |
|------------------------|---|---|
| Signal type            | open collector  | square wave   |
| Output signal:<br>high | dependent on target geometry and sensor-to-target orientation | $(V_p \times 16.5) / (16.5 + R_p \text{ in kOhm})$ 0.3 V to 2.2 V                 |
| low                    |   | $\leq ((V_p - 0.4) \times 1\text{ k}) / (1\text{ k} + R_p \text{ in kOhm}) + 0.4$ |
| Load current           | –   | 15 mA   |
| Frequency              | –   | 0 kHz to 10 kHz   |

**SNG-SPRD-003**  
**SNG-SPRC-002**



| CHARACTERISTIC         | CONDITION/COMMENT                     | PARAMETER                    |
|------------------------|---------------------------------------|------------------------------|
| Signal type            | open collector                        | square wave                  |
| Output signal:<br>high | dependent on the controller interface | $\geq V_{cc} - 0.5\text{ V}$ |
| low                    |                                       | $\leq 0.5\text{ V}$          |
| Load current           | –                                     | 20 mA                        |
| Frequency              | –                                     | 0 kHz to 10 kHz              |

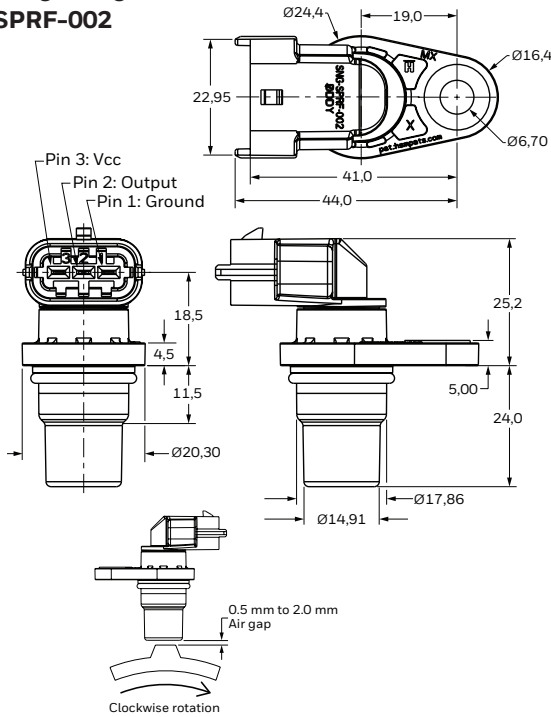
**SNG-SPRD-004**  
**SNG-SPRC-003**



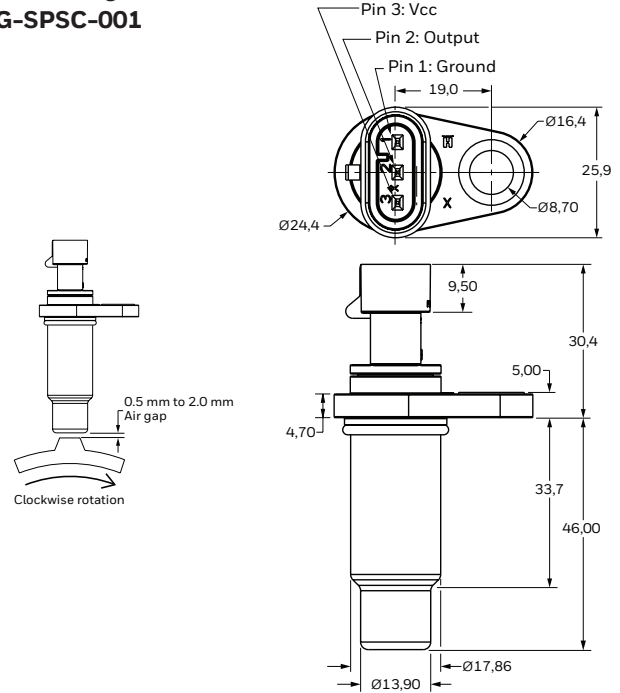
| CHARACTERISTIC         | CONDITION/COMMENT                     | PARAMETER  |
|------------------------|---------------------------------------|--|
| Signal type            | open collector                        | square wave  |
| Output signal:<br>high | dependent on the controller interface | $(V_p \times 16.5) / (16.5 + R_p \text{ in kOhm})$ 0.5 V |
| low                    |                                       | $< 0.5\text{ V}$   |
| Load current           | –                                     | 20 mA  |
| Frequency              | –                                     | 0 kHz to 10 kHz  |

**FIGURE 3. MOUNTING DIMENSIONS (FOR REFERENCE ONLY: MM/[IN.] )**

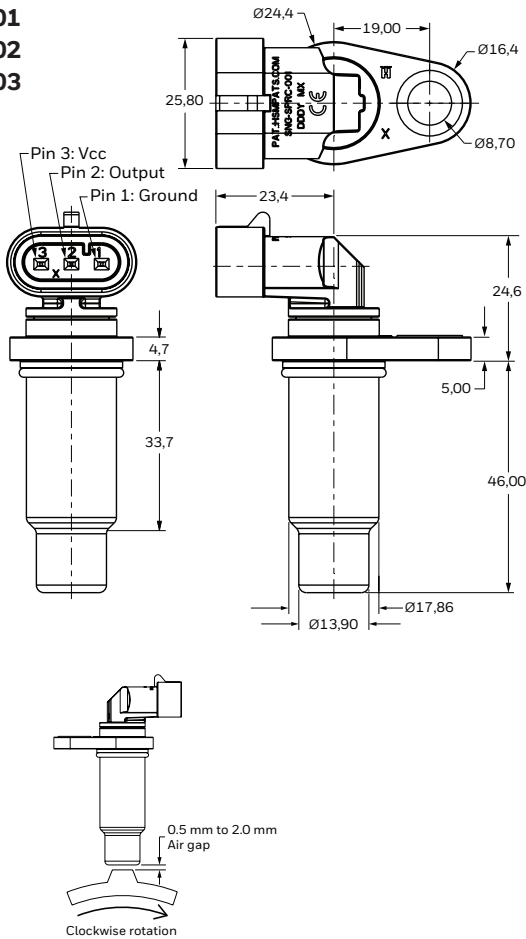
**24 mm, right angle:  
SNG-SPRF-002**



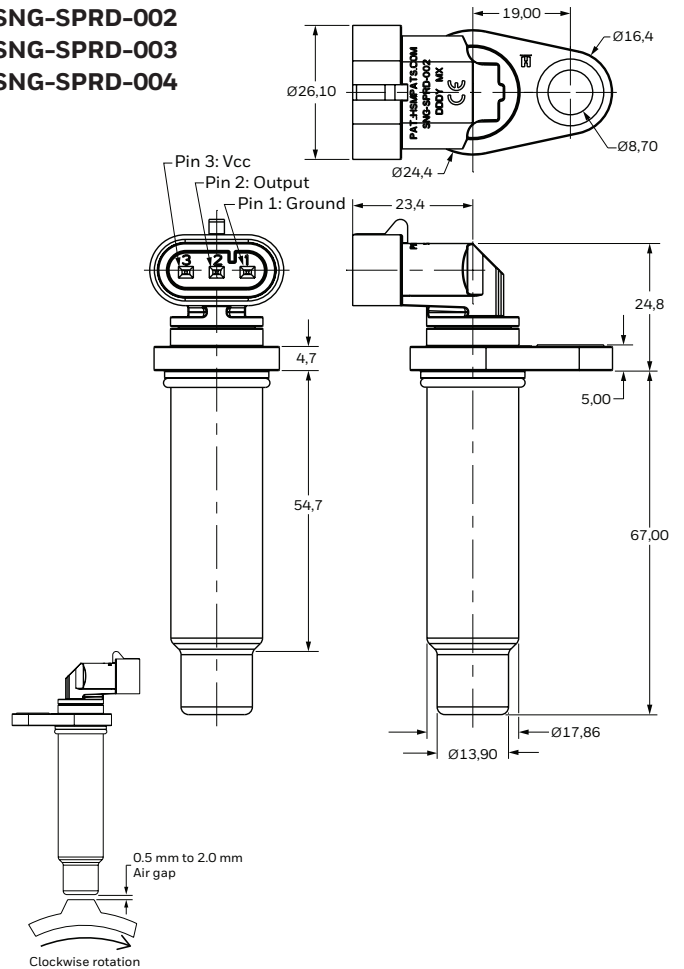
**46 mm, straight:  
SNG-SPSC-001**



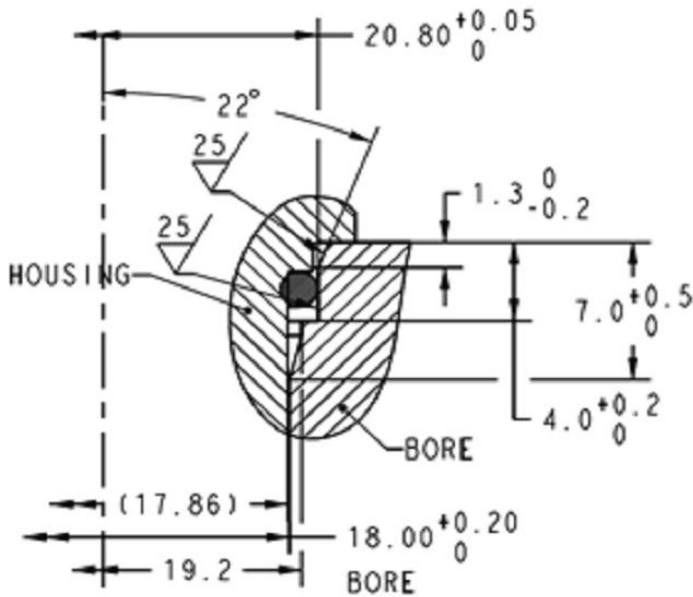
**46 mm, right angle:  
SNG-SPRC-001  
SNG-SPRC-002  
SNG-SPRC-003**



**67 mm, right angle:  
SNG-SPRD-002  
SNG-SPRD-003  
SNG-SPRD-004**



**FIGURE 4. CUSTOMER INTERFACE BORE**



**⚠ WARNING  
PERSONAL INJURY**

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

**Warranty/Remedy**

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell’s standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective. **The foregoing is buyer’s sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

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